

Virginia Lake Water Quality Improvement Project

9/18/14 Meeting – Public Comments and Staff Responses

Public Comments:

1. BIRDS

Diversity of birds

Birds – precious resource, 100's of species

Island is only close location to watch nesting

Birds won't leave if island is removed

Cormorants contribute 1/3 of phosphorus load, ducks and geese 2/3

City created bird problem by not putting out appropriate bird feed and enforcing existing feeding regulations

Domesticated Swan – provide medical care so it is healthy

Remove and quarantine

Cut down more dangerous overgrown bird species instead of removing island

Birds die at Virginia Lake every year - Why the urgency now

Provide bird seed dispensers full of proper food

2. FISH

Get rid of fish in lake/ Stop stocking the lake w/fish

Cut back on the number of fish stocked.

3. OTHER SOLUTIONS

Use aqua-ponics to clean water

Use sand to grow plants.

Use windmills to generate power to run the pump to aerate the lake.

Add circulation, restore the wetlands and add aeration.

"Manmade Floating Islands Use Recycled Plastic" to create artificial wetlands.

use windmills for power, water mill approach

Identify alternatives before acting on island removal

Time to get proposals, not move forward w/island removal yet

Identify filtration, hydroponics, solar/wind power

Remove island as last resort

Lower island instead of removing

Create wetlands on north and south ends of lake

Expand solutions

Antiquated approach – solution should be less destructive

4. MISC. STATEMENTS/QUESTIONS

What's the total cost of island removal/circulation

The island is ugly – “pit of poop”

All area waters suffer from same challenge due to drought

Citizens need more details/answers before moving forward

Virginia Lake is most valuable asset in City

Citizens own the lake

Will the Army Corp be involved in Phase I/II permitting process

Virginia Lake is historically significant – should protect all elements

Have the hydraulics well assessed to prevent the circ system from failing

Public comment- STAFF RESPONSES.

1. BIRDS:

The City is committed to providing a healthy ecosystem for recreation, bird watching, ecosystem services, and quality of life for residents. The bird populations at Virginia Lake have increased and are now beyond the carrying capacity of the lake, as seen in the poor water quality of the lake. Staff has identified a point source of phosphorus on the lake drainage area as the island, where vast numbers of birds nest, excrete, and sleep. Dominant species on the island include cormorants and gulls, primarily fish eaters with rich diets. Even in this low flow condition, with unhealthy waters that have killed off the adult fish, the island is used as a roost overnight after birds have eaten elsewhere. Without removing the island, even without fish present, the birds will not relocate, but continue nesting, importing unhealthy levels of nutrients, and creating conditions ripe for harmful algae blooms. This was the first year the City staff monitored and documented the blue green algae bloom, although there have been historical reports of poor water quality, high phosphorus, and low dissolved oxygen, as documented in the Virginia Lake Management Plan (2001). This was the first year the lake was closed for public health concerns, and as manager of the lake, the City is interested in remedying the water quality situation with an ecosystem approach, and providing healthier habitat for residents and wildlife.

Cormorants have been seen as a nuisance species in various communities around the country, and a framework for their management in the Pacific Flyway was published (Pacific Flyway Nongame Migratory Bird Technical Committee, U.S. Fish and Wildlife Service, 2012). This document called out various methods for managing populations of birds, the least harmful being removal of habitat. The City may lessen the dominant populations by removing this nesting habitat and providing more space for other bird species to live on Virginia Lake. Recommendations from the public included the installation of appropriate bird seed in dispensers and better education on the needs of wild birds, but staff have concerns that there is not sufficient staff to enforce nor maintain dispensers.

Loading of nutrients by fish-eating birds is higher per bird than vegetarian or omnivorous birds. The Skiles/Walker thesis paper showed predation of stocked fish by island nesting birds, however provides a low estimate of nutrient loading by fish eaters. Assumptions cannot take the place of data, as stated in the study, along with the recommendation of collecting species specific data and time series data. Staff gathered intensive water quality and phosphorus data for the water in the lake. Storm water data may be collected to gain understanding of loading in storm events, but this will take time and discharge captured from storms to accumulate.

The cyanotoxin, from blue-green algae, has never been detected in this lake before, and has been responsible for pet illness and deaths in other communities. This toxin triggered the public health closure on Virginia Lake, and removing this condition to restore a healthy habitat is a large goal of this project. The high levels of phosphorus in Virginia Lake were measured at roughly 50-100x higher than typically found in the Truckee River.

The City has not tested storm water pollution entering Virginia Lake from the watershed, but levels of nitrogen and phosphorus in storm water are typically classified as non point source, or low levels entering from disparate sources through the urban areas. This contrasts with the island, which is a point source of nutrients, typically seen as having higher levels of pollutants.

2. FISH

Skiles' study revealed 100% of stocked fish are being eaten by birds living on the island. To reduce predation by birds, the study recommended lessening the amount of fish in stocking programs, and changing the timing from spring to fall. Without modeling the carrying capacity of the lake NDOW already changed fish stocking timing to fall, to benefit the fish populations and urban angler program. It is expected that the removal of habitat would result in the cormorant populations finding another place to live where there are fish and nesting habitat. (i.e. Washoe Lake, Anahoe Island- Pyramid Lake)

3. OTHER SOLUTIONS

Alternatives identified and considered:

A search to identify other point sources of phosphorus that could be amended/treated prior to entry to the lake. Staff called on 2 golf courses in the drainage area. Neither use a strong phosphorus formulation to grow turfgrass, according to operations staff.

Installing floating gardens lashed to gangplanks, using public access to prevent birds from nesting and encourage them to go elsewhere. Incorporating a fishing dock on stilts over current island location may be feasible. Example includes Living Machines technology – these have been used throughout the world to provide natural treatment of black water systems or severely nutrient enriched waters. This idea may be considered as Phase 3, to provide nutrient uptake and fish habitat, preventing predation from cormorants by providing root systems for fish refugia. This option will be evaluated carefully to not re-introduce nesting habitat as an island on the lake.

Gangplanks could possibly house duck boxes attached to the bottoms of the boardwalks to provide some nesting habitat may be feasible, and requires more study. Circulation may need to be augmented to ensure flow around the island area. Surface of island is dangerous to public and difficult to discourage public from entering water from the island. It is not the City's intent to provide a bathing lake.

A hybrid option is remove the island in its current size and location; could we remove a portion of the surface area of the island to reduce nesting populations? Could fishing pier be located close by but far enough to not discourage nesting behavior? Could floating gardens be located in gaps along gangplanks to allow for duck nesting/ can we architect the gardens' species makeup to provide a value-added green benefit (to be harvested in the fall season and used for floral or restoration projects?) We are investigating these questions, but it seems that this may not be sufficient, especially in a long-term drought situation.

Vegetation installed to the lake may be done carefully to improve water quality but only with noninvasive species. This lake is a high hazard dam, and requires capacity for protection of the community. Areas of nesting habitat potential are being evaluated by staff, and may be incorporated to the shoreline areas in the park. This re-establishment of waterfowl habitat along the shoreline may also serve as a storm water treatment area during discharge events.

Point source removal of the island is a nondestructive method of reducing cormorant populations by reducing habitat, consistent with the "Pacific Flyway Plan: A Framework for the management of double-crested cormorant depredation on fish resources in the Pacific Flyway," By the Pacific Flyway Nongame Migratory Bird Technical Committee and the Double-crested Cormorant Subcommittee. This removal of habitat is in line with treating secondary issues caused by an overpopulation of birds, while reducing impacts on nesting populations. The island removal would be accomplished during the non-nesting season, and coupling birds will simply move to another location where there is habitat, either Washoe Lake, Anahoe Island on Pyramid Lake, or another pond or lake in the area. The removal may be coupled with non point source treatment cells such as marshy areas where habitat may be created in a protected refugia for birds. This package replaces nesting habitat on shore, protected by a fence, where public may use nearby trails to observe nestlings.

Water quality treatment systems using proprietary wastewater chemicals are not an option for Virginia Lake. After a close evaluation of some products whose salesmen contacted staff directly, using a flocculant and proprietary bacteria, and a technical review of unanswered water quality issues resulting from its use, staff deemed this not feasible in treating the lake for an Ecosystem approach.

Using sand to filter water and grow plants: this system would require pumps and land application of water to treat water quality. A consideration is that there need to be mitigation of pollutants entering the lake, as well as a treatment plan for removing the pollutants, in order to re create a balanced Ecosystem. The staff is evaluating options to meet both needs.

4 MISC. STATEMENTS/QUESTIONS

The Island removal is estimated at \$64,000, and the circulation has a preliminary estimate at \$400,000. Once the design is finished, we will have a more realistic figure.

Avian Botulism, the factor causing the duck deaths per NDOW, is a common condition in the region, even in non-drought years. The cyanotoxin from the bluegreen algae, has never been assessed in this lake before, and had been responsible for pet illness and deaths in other communities. This toxin triggered the public health closure on Virginia Lake, and eradication of this condition is a major goal of the project. Other waters have not seen this level of algal density, nor toxicity, and assumedly, not seen the extremely high levels of pollutants, from 10-100x higher than typically seen in the Truckee River. There have not been federal funds obtained for this grant, and the ACOE did not see a need for their involvement in improving the water quality of Virginia Lake through this first phase. Virginia Lake has been historically significant, with recreation and uses evolving as the community changes.